

CLAIMS

1. A method for manufacturing a semiconductor chip, which comprises a tape adhesion step of sticking a
5 pressure sensitive adhesive tape for dicing having a pressure sensitive adhesive layer containing a gas generating agent for generating a gas by radiating light to a semiconductor wafer with a circuit formed; a dicing step for dicing the wafer with the pressure sensitive adhesive
10 tape for dicing stuck and dividing the semiconductor wafer into each semiconductor chip; a separation step of separating at least a portion of the pressure sensitive adhesive tape for dicing from the semiconductor chip by radiating light to the divided each semiconductor chip; and
15 a pickup step of picking the semiconductor chip up by a needle-less pickup method.

2. The method for manufacturing a semiconductor chip according to claim 1,
20 wherein the pressure sensitive adhesive tape for dicing is stuck to the face with the circuit formed of the semiconductor wafer in the tape adhesion step.

3. The method for manufacturing a semiconductor chip according to claim 1 or 2,
25 wherein an ultraviolet ray having radiation intensity of 500 mW/cm² or higher at wavelength of 365 nm is radiated in the separation step.

30 4. The method for manufacturing a semiconductor chip according to claim 1 or 2,
wherein light is radiated immediately before the semiconductor chip is aspirated by an aspiration means or while the semiconductor chip is aspirated by an aspiration
35 means in the separation step.

5. The method for manufacturing a semiconductor chip according to claim 1, 2, 3, or 4,

5 wherein light emitted from a light source is led to the pressure sensitive adhesive tape for dicing stuck to each semiconductor chip in the separation step.

6. The method for manufacturing a semiconductor chip according to claim 1, 2, 3, 4, or 5,

10 wherein radiation intensity X (mW/cm^2) of the ultraviolet ray radiated to an aimed semiconductor chip and a ratio Y_3 (%) of surface area of the aimed semiconductor chip exposed previously to an ultraviolet ray when the ultraviolet ray being radiated to another semiconductor 15 chip satisfy the relationship represented by the following formula (3):

$$Y_3 \leq 0.013X + 46.5 \quad (3)$$
$$(Y_3 \leq 95).$$

20 7. The method for manufacturing a semiconductor chip according to claim 5 or 6,

25 wherein the light radiated to the entire face of the semiconductor chip has radiation intensity having a fluctuation range within 20% of the average radiation intensity.

8. The method for manufacturing a semiconductor chip according to claim 5 or 6,

30 wherein the light radiated to the semiconductor chip has the average radiation intensity in the inner portion of 5 to 30% of the adhesive face widened concentrically or 35 rectangularly from the center position of the semiconductor chip in the entire adhesion surface area of the semiconductor chip being 40 to 70% of the intensity to the average value of the radiation intensity in the portion

other than the inner portion of the adhesive face.

9. The method for manufacturing a semiconductor chip according to claim 5 or 6,

5 wherein the light radiated to the semiconductor chip has the average radiation intensity in the inner portion of 5 to 30% of the adhesive face widened concentrically or rectangularly from the center position of the semiconductor chip in the entire adhesion surface area of the
10 semiconductor chip being 150 to 250% of the intensity to the average value of the radiation intensity in the portion other than the inner portion of the adhesive face.

10. The method for manufacturing a semiconductor
15 chip according to claim 1, 2, 3, 4, 5, 6, 7, 8, or 9,

wherein the separation step is carried out in inert gas atmosphere.

11. The method for manufacturing a semiconductor
20 chip according to claim 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10,

wherein the pickup is carried out without expanding the pressure sensitive adhesive tape for dicing in the pickup step.

25 12. A method for separating a pressure sensitive adhesive tape for separating a pressure sensitive adhesive tape having a pressure sensitive adhesive layer containing a gas generating agent for generating a gas by radiating light from a semiconductor wafer or a semiconductor chip
30 with the pressure sensitive adhesive tape stuck,

wherein radiation intensity X (mW/cm^2 ; X is within 500 to 10,000 mW/cm^2) of an ultraviolet ray with wavelength of 365 nm radiated to a semiconductor wafer or a semiconductor chip stuck to the pressure sensitive adhesive
35 tape and a ratio Y_3 (%) of the surface area of the

semiconductor chip exposed to an ultraviolet ray before the ultraviolet ray being radiated satisfy the relationship represented by the following formula (3):

$$Y_3 \leq 0.013X + 46.5 \quad (3)$$

5 $(Y_3 \leq 95)$.